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[0001] The invention refers to a dishwasher with a spraying system, which becomes fed by means of a circulating pump propelled by an electric motor from collecting tub with cleaning liquid, a having a water inlet valve. With such dishwashers there are general efforts, which water consumption, of which simultaneous is also the amounts of energy dependent required to the heating of the water, to hold as low as possible. Likewise a smaller water supply affects the noise creation of the machine favourably.

[0002] With known dishwashers their water filling becomes either certain by the use of float switches or a rule nozzle in the solenoid valve over the break-in period. Both systems permit however only in each case to supply to the machine a pre-determined quantity of water which does not correspond however to the optimum value, but rather to large dimensioned is. The reason for this consists of it that a safety addition must become given, in order the cavitation connected with unpleasant work noises in the circulating pump, which results whenever becomes promoted of it with air mixed water, only with the start of the machine arise to let, however during the actual operation to absolutely avoid.

[0003] Bottom that managing stated aspects consists the object of the invention of making a dishwasher whose water supply becomes more available so regulated that in the collecting tub straight in each case only so much cleaning liquid is, how required is, so that the circulating pump without cavities works and to that extent to a large extent noise-free.

[0004] The solution of the object posed goes out of the claims as well as out of the diagrams of the Fig. 1-4 out, those together with the Fig. 5 several embodiments of the invention show. Into the Fig. in addition 6-9 is shown measuring diagrams of a conventional dishwasher, which it furnishes the proof that the detection of the stable operation condition of the circulating pump is and at the same time thus also the determination of the required quantity of water in the machine in the sense of the stressed measures possible.

[0005] Into the Fig. 1-4 contained reference numerals have the subsequent importance:

Fig. 1

- 1 = current measuring instrument (shunt)
- 2 = amplifiers with rectifier
- 3 = high-pass
- 4 = pump motor
- 5 = comparator (preferably with hysteresis)
- 6 = switching signal for water inlet valve

Fig. 2

- 1 = current measuring instrument (shunt)
- 2 = amplifiers with rectifier
- 3 = high-pass with amplifier
- 4 = pump motor
- 7 = comparators
- 8 = switches
- 9 = solenoid valve (water inlet valve)

Fig. 3

- 10 = phase discriminator
- 11 = high pass filter
- 12 = comparator
- 13 = a phase induction motor
- 14 = output signal for water inlet valve

Fig. 4

- 20 = microphone (impact sound Piezomikrofon)
- 21 = amplifiers
- 22 = rectifiers
- 23 = comparator
- 24 = switching signal for water inlet valve

[0006] Like the measuring diagrams of the Fig. 6-9 coincident to recognize leave, are the performance of the circulating pump during the water A RUn in the same way out of it to be always taken. Thus the pump runs first of all emptier, until it comes with reaching a certain minimum filling of the collecting tub in irregular distances to different pressure and load impacts. Only after itself the pump has complete filled, a state without power fluctuations and therefore a stable operating attitude adjusts itself. This on various paths, i.e. over the power input or the capacitor voltage of the pump motor, the liquid pressure in the spraying system, in addition, the engine speed, the flow rate of the required cleaning liquid or the noise level and/or. the shocks of the machine unique measurable, used into which diagrams by a dash-dotted perpendicular line marked optimum operating point can become then closing the water inlet valve, so that one can get along with a significant smaller quantity of water, than it is current to determine and therefore conventional.

[0007] The corresponding diagrams of the Fig. the stable state does not only occur 6-9 independent ones of the respective measurement method always at the same location, but it is also dependent of it whether only with clear water or with various rinsing agents one works. In this way still additional water and energy are to be saved, as the quantity of water in the single rinsing processes of the alternate consistency of the cleaning liquid can be adapted in every detail. Into each cases will a closing of the water inlet valve, with which it can concern to the difference of the state of the art a whole simple intake valve, in the appropriate time caused, with which the dishwasher according to invention exhibits both the lowest possible water and energy requirement, to be worked and in the layer is, noiselessly.